cristie software

The preferred choice
for **disaster recovery**
and **data backup**

CBMR

Cristie Bare Machine Recovery

Automated Disaster Recovery User Guide

For Windows

July 2012

Version 6.4

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1 Introduction

This document describes how to configure and run automated disaster recoveries in conjunction with one of the Cristie range of bare metal disaster recovery products; CBMR in this case.

The steps required to *prepare* for automated Disaster Recovery (DR) are as follows:

1. Install the CBMR product
2. Create the system configuration
3. Create a system backup
4. Create an automated DR answer file
5. Optionally inject the answer file into the DR recovery environment or copy to a Windows compatible removable device (e.g. USB disk)

The steps required to *run* an automated DR are as follows:

1. If the DR answer file is located on a removable device, ensure it is connected to the recovery machine
2. Boot the customised DR recovery environment

Each process is explained in the following chapters of this document.

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2 Preparation

To enable successful automated DR, the following steps should be taken.

2.1 Install CBMR

Run a normal installation of the Cristie CBMR product. Refer to the separate product **Installation and Licensing Guide** for instructions on how to do this.

The Cristie **Answer File Creator** (AFC) program will be installed along with the main product.

2.2 Create System Configuration

With CBMR, a system configuration will be captured for the system during the installation.The system configuration will also be automatically created every time a DR backup is made.

Refer to the separate **CBMR User Guide** for further details on this.

2.3 Create System Backup

Create a full backup as described in the separate **CBMR User Guide** document.

2.4 Create Answer File For Automated DR

During an interactive DR session, the user would normally specify recovery parameters. Such parameters would typically include:

- setup network details (DHCP/static IP, gateway IP etc)
- network details of the Cristie server (hostname/IP address, port no.)
- automatic/manual recovery
- define disk partition layout for recovery
- select partitions to recover
- commence SystemState/file restore
- view/copy log files
- re-boot after DR
- driver location for dissimilar recovery where applicable

During an unattended DR, this same information must be prepared in advance - captured to an answer file and made available to the DR environment as part of the DR start-up process.

Cristie supply an **Answer File Creator** (AFC) tool with their BMR products to help you create the answer file. The format of the file is in the form of a structured INI file and may be edited by any Windows editor such as Notepad or Wordpad. However, it is strongly recommended that the AFC tool is used to initially create the answer file.

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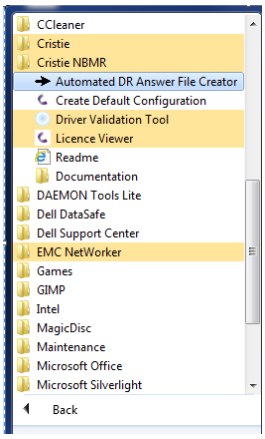
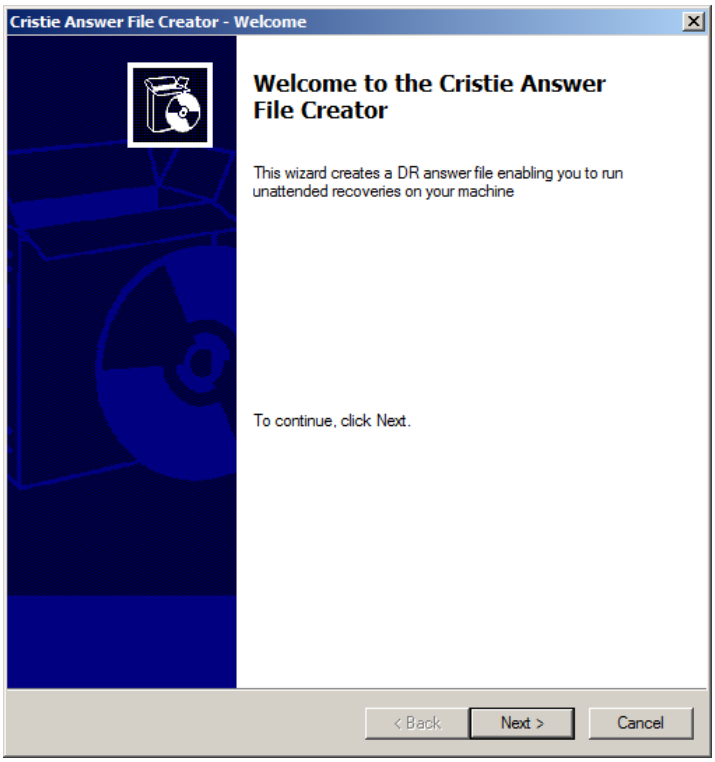
2.4.1 Running the Cristie Answer File Creator Tool

Run the **AFC** tool from the **Windows Start** menu:



This will invoke the AFC Welcome dialogue:


Cristie Answer File Creator - Welcome
Welcome to the Cristie Answer File Creator
This wizard creates a DR answer file enabling you to run unattended recoveries on your machine
To continue, click Next.
< Back
Next >
Cancel

Select Next> to continue to the following dialogue where you can choose to modify an existing file or create a new one.

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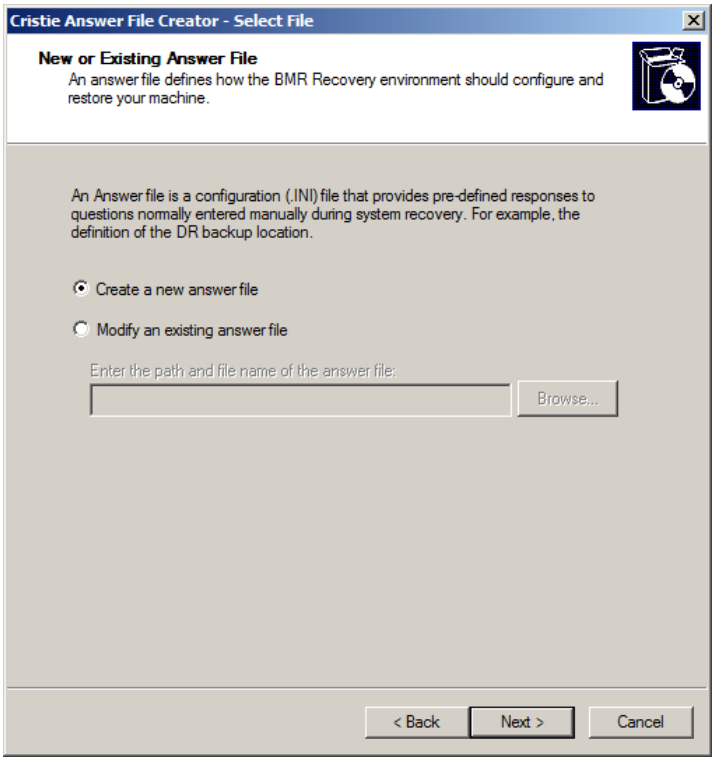
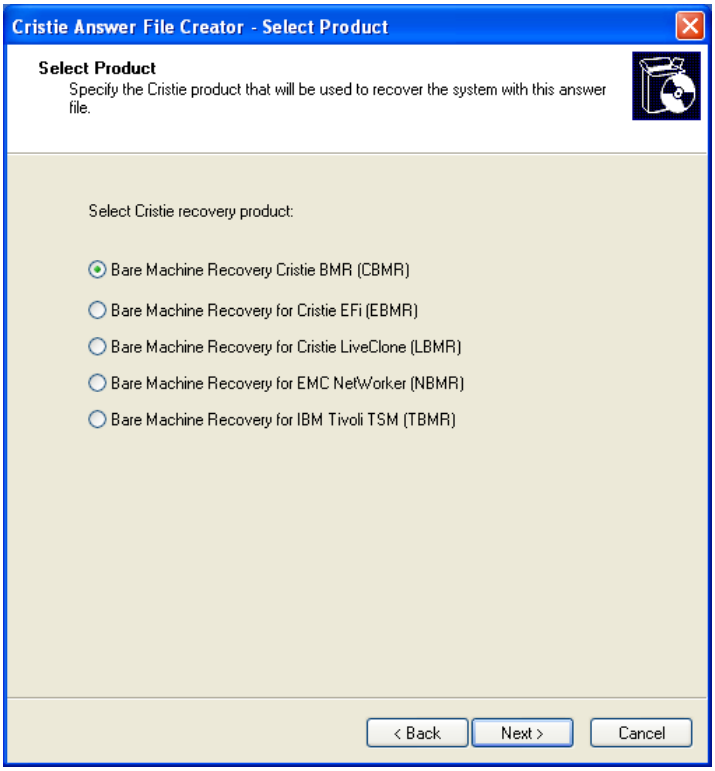

Cristie Answer File Creator - Select File
New or Existing Answer File
An answer file defines how the BMR Recovery environment should configure and restore your machine.
An Answer file is a configuration (.INI) file that provides pre-defined responses to questions normally entered manually during system recovery. For example, the definition of the DR backup location.
Create a new answer file
Modify an existing answer file
Enter the path and file name of the answer file:
Browse...
< Back
Next >
Cancel

Select 'Create a new answer file' and click the Next> button. You can then define the Cristie BMR product that the answer file is being created for.

Note: you may use the Next > and < Back buttons at any time to change information you have already entered before creating the answer file. Select Cancel at any time to abandon the answer file creation process and exit the program.


Cristie Answer File Creator - Select Product
Select Product
Specify the Cristie product that will be used to recover the system with this answer file.
Select Cristie recovery product:
Bare Machine Recovery Cristie BMR (CBMR)
Bare Machine Recovery for Cristie EFi (EBMR)
Bare Machine Recovery for Cristie LiveClone (LBMR)
Bare Machine Recovery for EMC NetWorker (NBMR)
Bare Machine Recovery for IBM Tivoli TSM (TBMR)
< Back
Next >
Cancel

Choose the CBMR product and select Next >.

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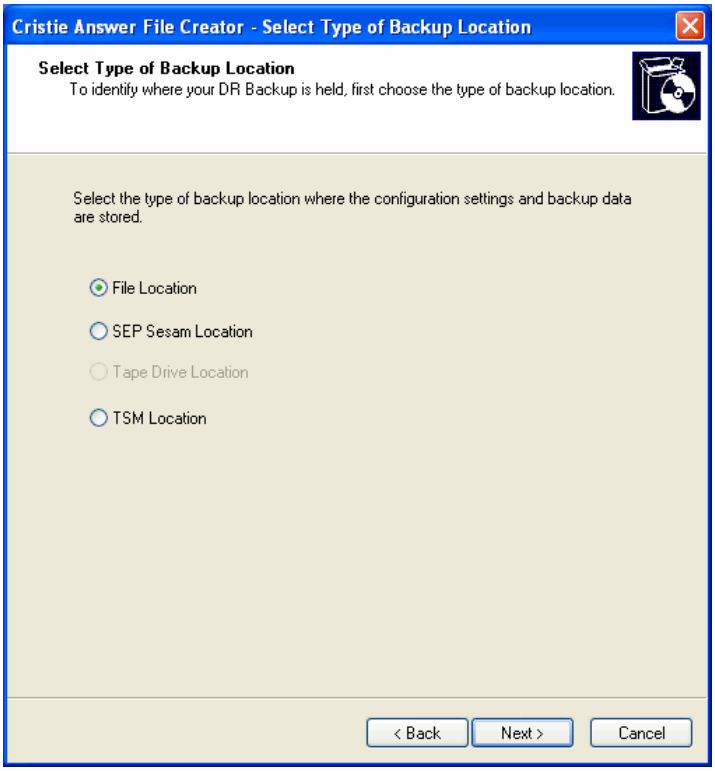
The next dialogue allows you to choose the Type of Backup Location. This can be a File Location, SEP Sesam Location or a TSM node.


Cristie Answer File Creator - Select Type of Backup Location
Select Type of Backup Location
To identify where your DR Backup is held, first choose the type of backup location.
Select the type of backup location where the configuration settings and backup data are stored.
File Location
SEP Sesam Location
Tape Drive Location
TSM Location
< Back
Next >
Cancel

Note: Tape is not currently supported for unattended DR.

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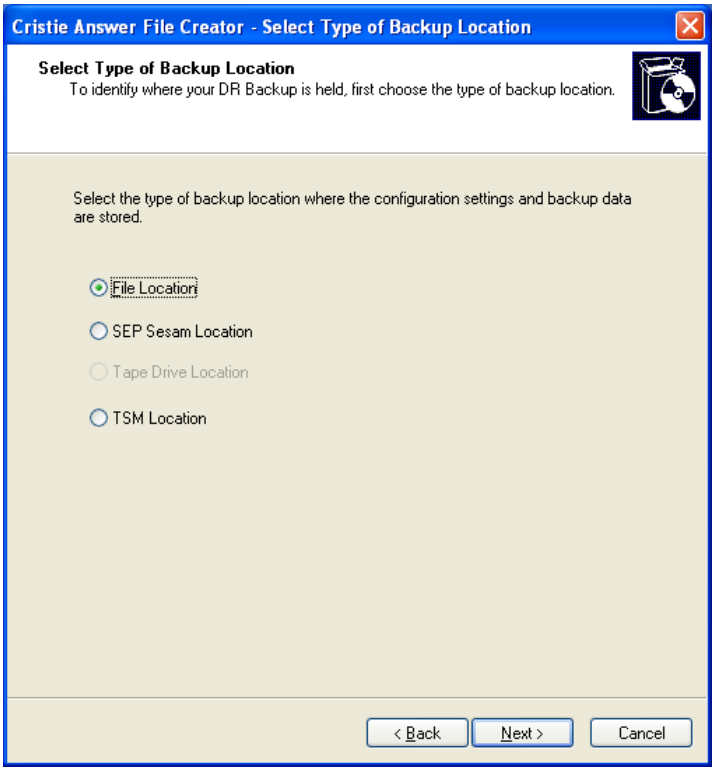
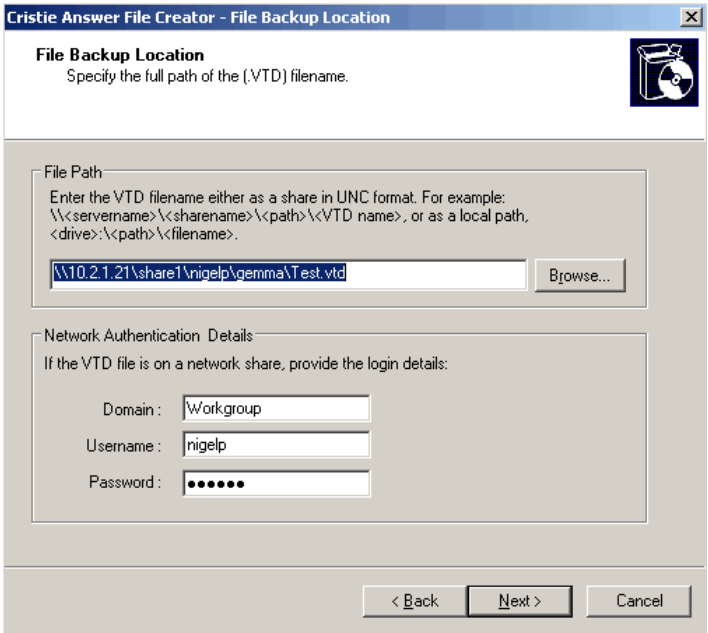
2.4.1.1 Backup To File Location

Select **'File Location'**:



Select Next> to proceed to the File Location specification details.

Now provide the full path to the VTD and the corresponding network authentication details:



Select Next>.

If the backup is encrypted, specify the location of the encryption key repository file if one exists, or the passphrase/clear key. If the backup is not encrypted, proceed to the next dialogue.

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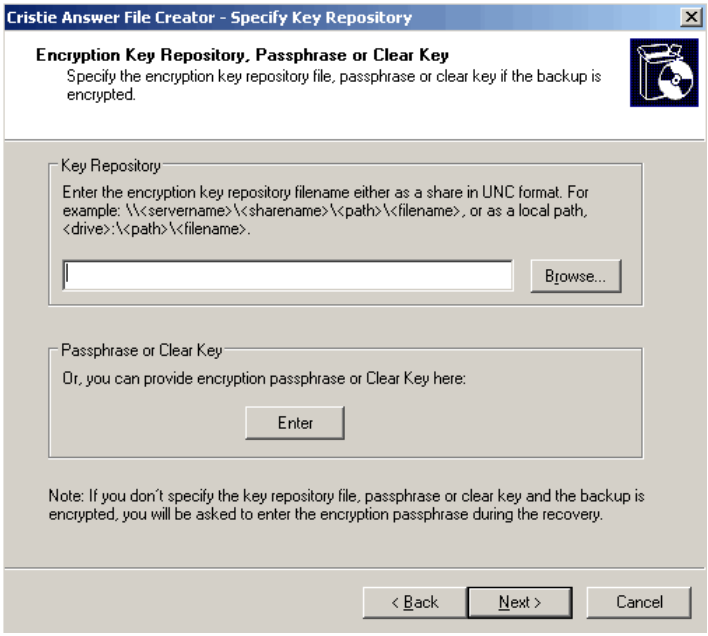
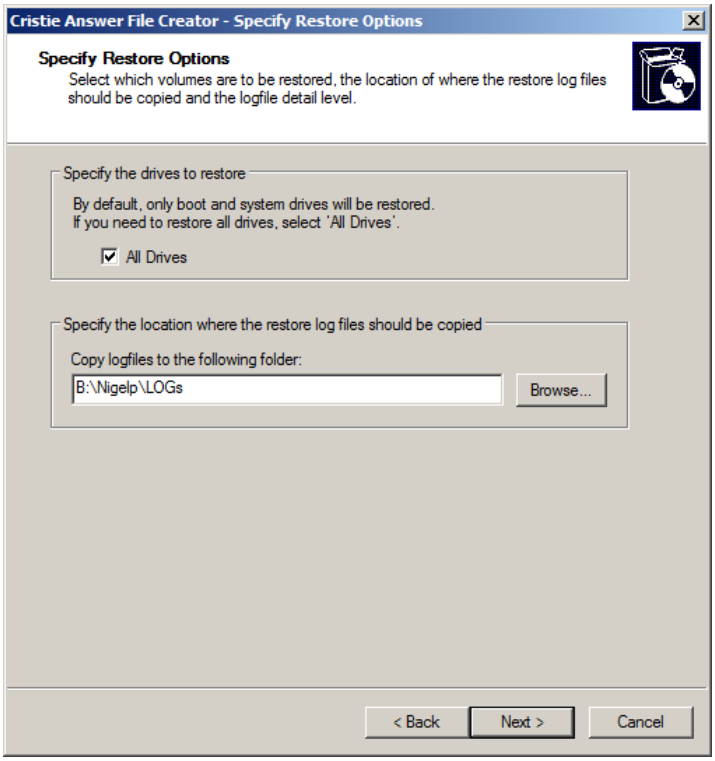

Cristie Answer File Creator - Specify Key Repository
Encryption Key Repository, Passphrase or Clear Key
Specify the encryption key repository file, passphrase or clear key if the backup is encrypted.
Key Repository
Enter the encryption key repository filename either as a share in UNC format. For example: \\<servername>\<sharename>\<path>\<filename>, or as a local path, <drive>:\<path>\<filename>.
Browse...
Passphrase or Clear Key
Or, you can provide encryption passphrase or Clear Key here:
Enter
Note: If you don't specify the key repository file, passphrase or clear key and the backup is encrypted, you will be asked to enter the encryption passphrase during the recovery.
< Back
Next >
Cancel

Select Next> to proceed to the **Specify Restore Options** dialogue.

By default, only **Boot** and **System** drives will be restored. You must specify where you want the restore logfiles to be copied at the end of the DR process (this is mandatory). You may also change the level of detail in the log files.


Cristie Answer File Creator - Specify Restore Options
Specify Restore Options
Select which volumes are to be restored, the location of where the restore log files should be copied and the logfile detail level.
Specify the drives to restore
By default, only boot and system drives will be restored.
If you need to restore all drives, select 'All Drives'.
All Drives
Specify the location where the restore log files should be copied
Copy logfiles to the following folder:
B:\Nigelp\LOGs
Browse...
< Back
Next >
Cancel

Select Next> to continue to the **Disk Operations** dialogue.

Detail the individual disks to be formatted on restore, or **All Disks** if all disks should be formatted. Identify individual disks as **0**, **1**, **2**...etc.

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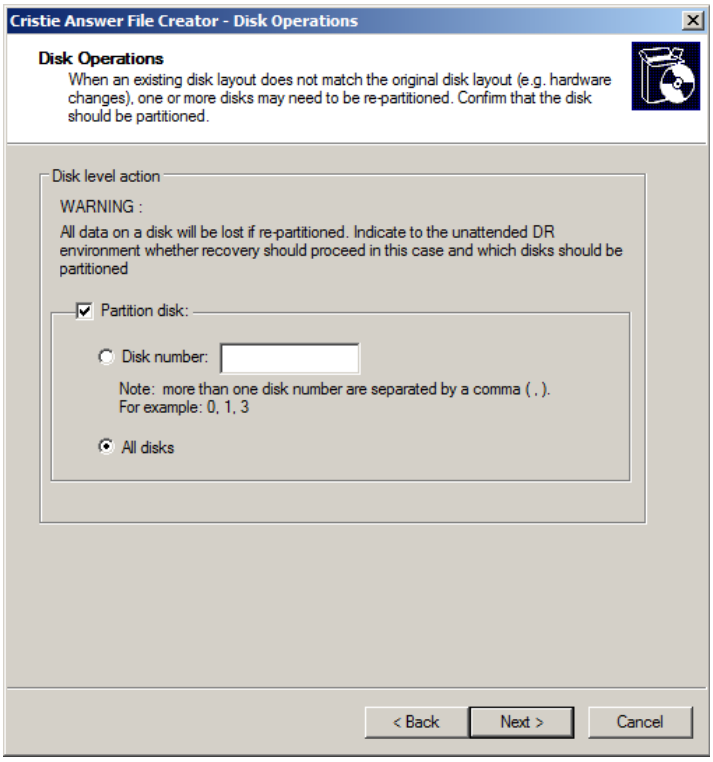
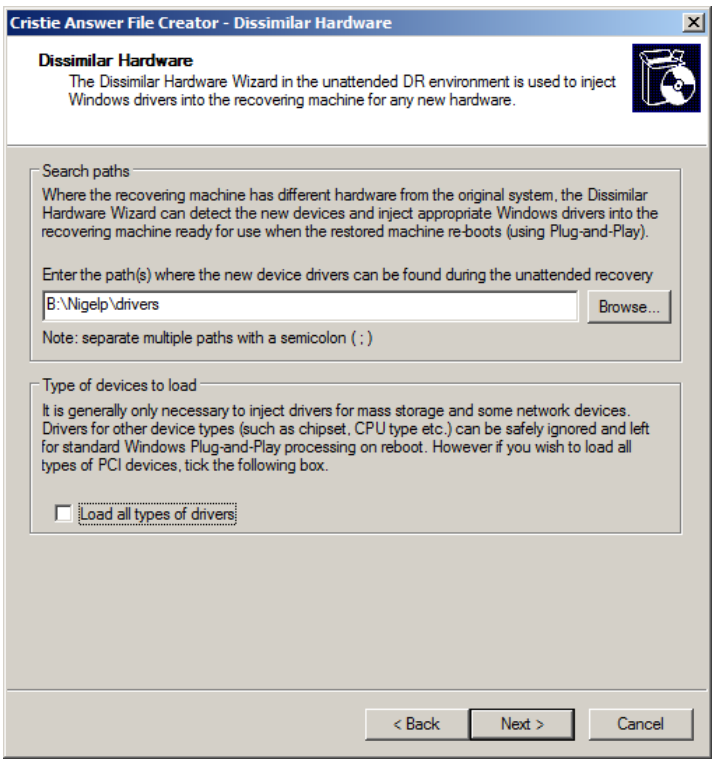

Cristie Answer File Creator - Disk Operations
Disk Operations
When an existing disk layout does not match the original disk layout (e.g. hardware changes), one or more disks may need to be re-partitioned. Confirm that the disk should be partitioned.
Disk level action
WARNING :
All data on a disk will be lost if re-partitioned. Indicate to the unattended DR environment whether recovery should proceed in this case and which disks should be partitioned
Partition disk:
Disk number:
Note: more than one disk number are separated by a comma (,).
For example: 0, 1, 3
All disks
< Back
Next >
Cancel

Select Next>. If the DR is to dissimilar hardware (ie. not the original system), then the recovered system may require new drivers to support different mass storage or network controllers. These new drivers are supplied by the customer and must be accessible to the **Dissimilar Hardware Wizard** (DHW) during the recovery process. Specify the location of a folder (or folders) where the DHW will retrieve these drivers from. For example, this could be a locally attached device like a USB disk or a network share, or both.


Cristie Answer File Creator - Dissimilar Hardware
Dissimilar Hardware
The Dissimilar Hardware Wizard in the unattended DR environment is used to inject Windows drivers into the recovering machine for any new hardware.
Search paths
Where the recovering machine has different hardware from the original system, the Dissimilar Hardware Wizard can detect the new devices and inject appropriate Windows drivers into the recovering machine ready for use when the restored machine re-boots (using Plug-and-Play).
Enter the path(s) where the new device drivers can be found during the unattended recovery
B:\Nigelp\drivers
Browse...
Note: separate multiple paths with a semicolon (;)
Type of devices to load
It is generally only necessary to inject drivers for mass storage and some network devices. Drivers for other device types (such as chipset, CPU type etc.) can be safely ignored and left for standard Windows Plug-and-Play processing on reboot. However if you wish to load all types of PCI devices, tick the following box.
Load all types of drivers
< Back
Next >
Cancel

Typically, only mass storage and network controllers need to be considered. However, if all driver

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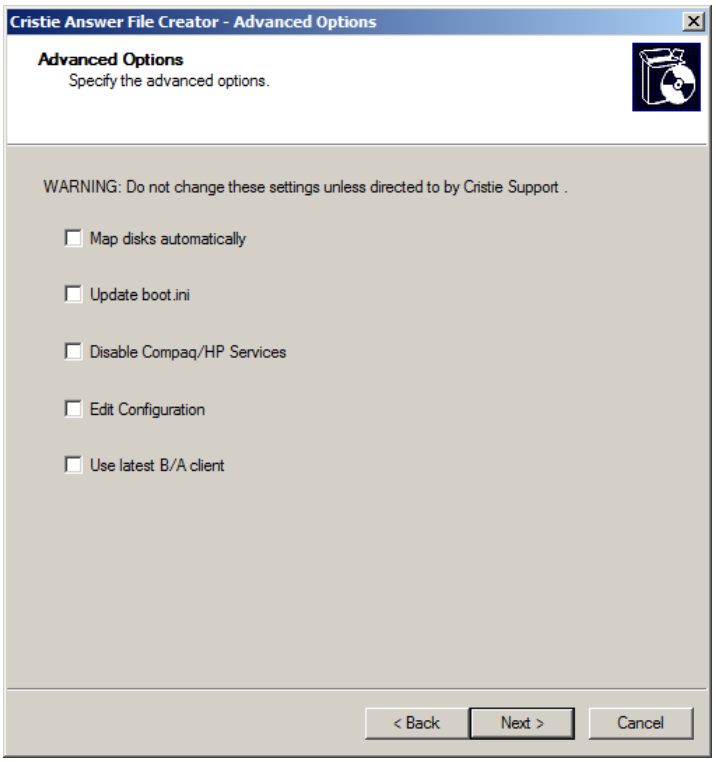
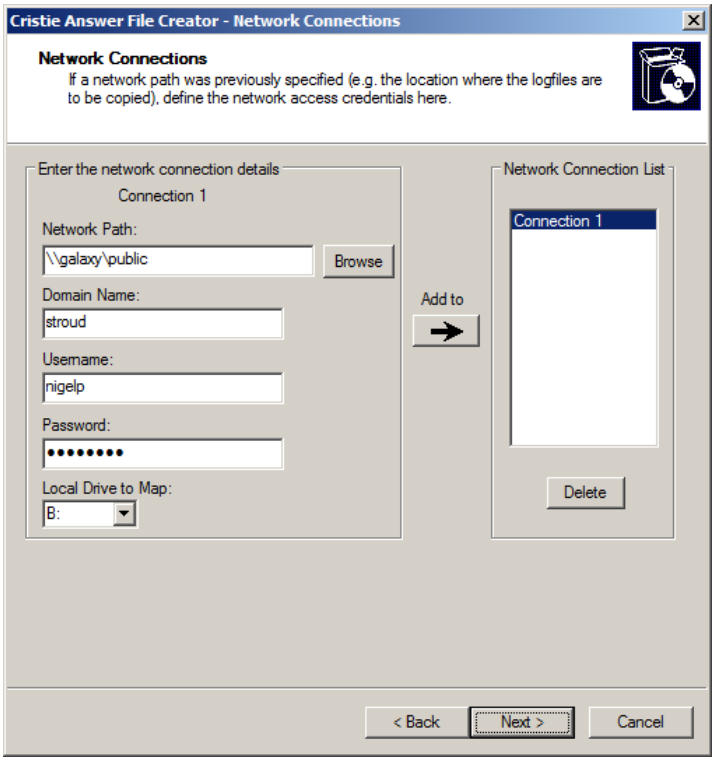
classes need to be examined, select the '*Load all types of drivers'* tick box. Select Next> to continue to the **Advanced Options** dialogue.

Unless **Cristie Support** direct you to change these settings, leave them at their default settings.


Cristie Answer File Creator - Advanced Options
Advanced Options
Specify the advanced options.
WARNING: Do not change these settings unless directed to by Cristie Support .
Map disks automatically
Update boot.ini
Disable Compaq/HP Services
Edit Configuration
Use latest B/A client
< Back
Next >
Cancel

Press Next> to continue to the **Network Connections** dialogue. Here you can define a list of network connection credentials that will be used by automated DR to access any network shares identified in earlier dialogues (eg. copy log files, DHW drivers etc).



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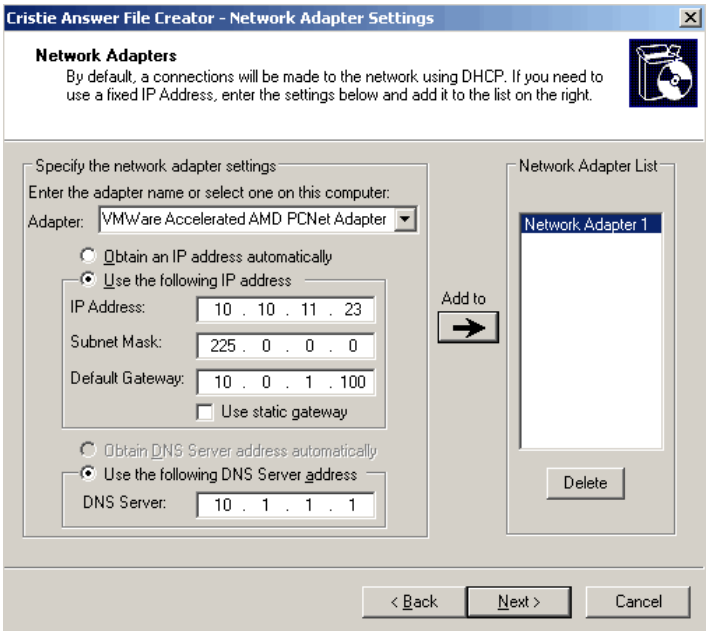
Press the Add to -> button to add a new definition to the Connection list. Use the Delete button to remove an existing Connection definition. Press Next> to continue to the **Network Adapter** dialogue.

You should now specify how the default network settings should be setup in the PE 2 DR environment at boot time.


Cristie Answer File Creator - Network Adapter Settings
Network Adapters
By default, a connections will be made to the network using DHCP. If you need to use a fixed IP Address, enter the settings below and add it to the list on the right.
Specify the network adapter settings
Enter the adapter name or select one on this computer:
Adapter:
VMWare Accelerated AMD PCNet Adapter
Obtain an IP address automatically
Use the following IP address
IP Address:
10 . 10 . 11 . 23
Subnet Mask:
225 . 0 . 0 . 0
Default Gateway:
10 . 0 . 1 . 100
Use static gateway
Obtain DNS Server address automatically
Use the following DNS Server address
DNS Server:
10 . 1 . 1 . 1
Add to
Network Adapter List
Network Adapter 1
Delete
< Back
Next >
Cancel

These settings apply to the recovery environment only - not the restored machine. Create a new **Adapter** name and associated network settings or use an existing network adapter and settings captured from the current host.

Press the Add to -> button to add a new definition to the Adapter list. Use the Delete button to remove an existing Adapter definition. Press Next> to continue to the **Reboot Options** dialogue.

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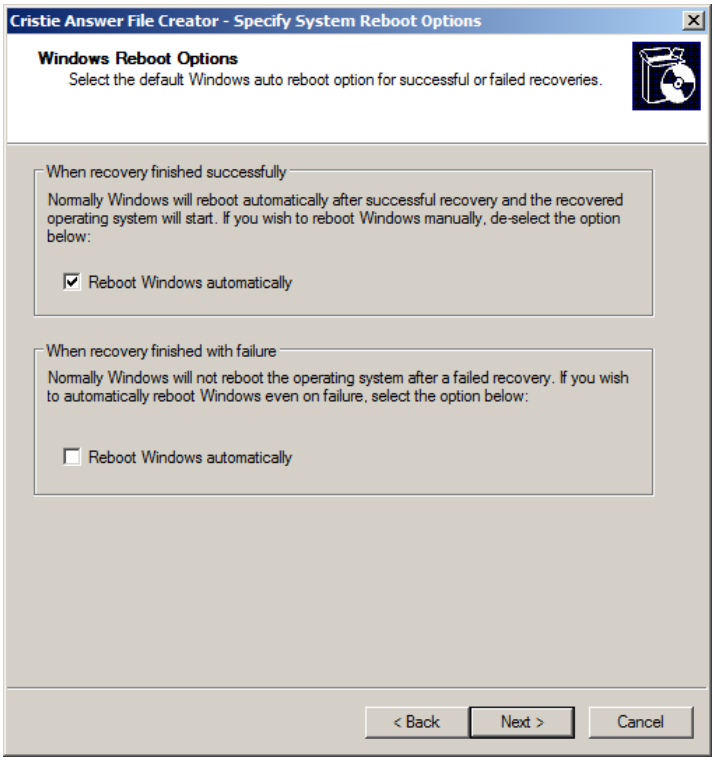
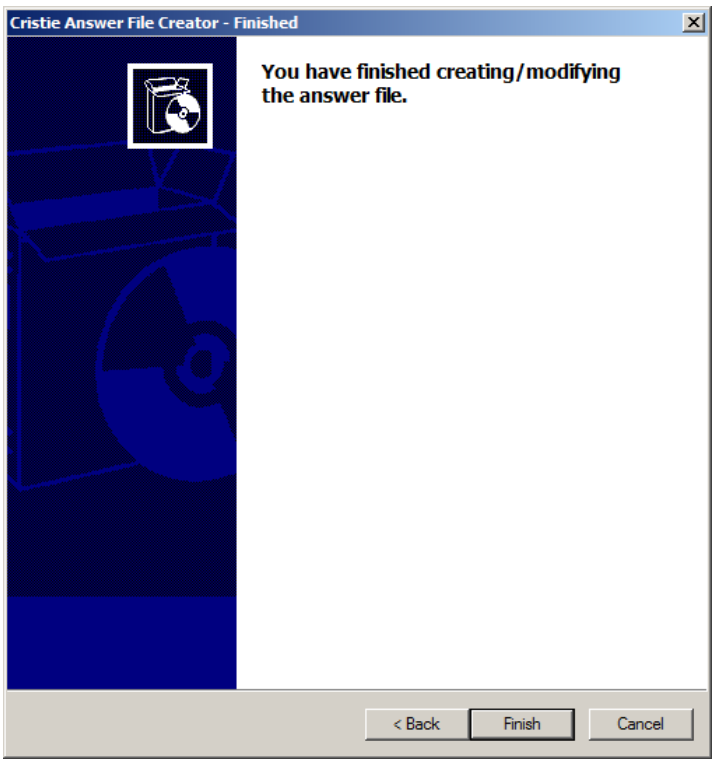

Cristie Answer File Creator - Specify System Reboot Options
Windows Reboot Options
Select the default Windows auto reboot option for successful or failed recoveries.
When recovery finished successfully
Normally Windows will reboot automatically after successful recovery and the recovered operating system will start. If you wish to reboot Windows manually, de-select the option below:
Reboot Windows automatically
When recovery finished with failure
Normally Windows will not reboot the operating system after a failed recovery. If you wish to automatically reboot Windows even on failure, select the option below:
Reboot Windows automatically
< Back
Next >
Cancel

Specify how the automated DR should handle the post recovery reboot when the DR finishes with success or failure. If the DR is successful, select the automatic reboot option. If the DR fails, it is unlikely that the reboot will succeed, so there is little point in proceeding with the reboot. However, if a reboot should be attempted, even in a failure scenario, tick the failure auto reboot option.

The completion of the Answer File definition is confirmed with the following dialogue:



Select Finish to generate the answer file. A pop-up will be displayed prompting for the name and

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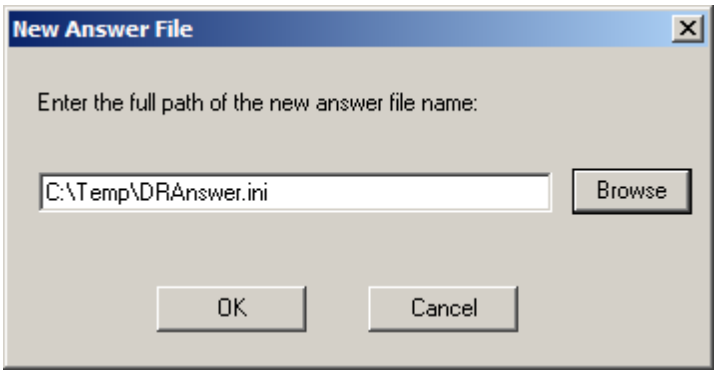
location of where the AFC should create the answer file.



Select a path and press OK. This will create a file called `DRAnswer.ini` in the `C:\Temp` folder.

Note: the answer file MUST be called DRAnswer.ini when transferred to the ISO.

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Answer File Content Example:

The content of a typical answer file is shown below for reference:

```
[ProductType]
Product = "CBMR"

[CbmrCmdBackupLocation]

FilePath=\\10.2.1.21\share1\nigelp\gemma\test.VTD
FileDomain=Workgroup
FileUserName=nigelp
FilePassword=Encrypted: 90B50BC86DDBA50E
DeviceType=File
EncryptLocType=
PointInTime=

[RestoreData]

Drives = "Default"

[LogFiles]

RestoreLogDetailed = "No"
LogfileCopyPath = "\\10.2.1.21\share1\nigelp\gemma"

[System]

RebootOnSuccess = "True"
RebootOnFailure = "False"

[DiskOperation]

PartitionDisk = "All"

[Cloning]
```

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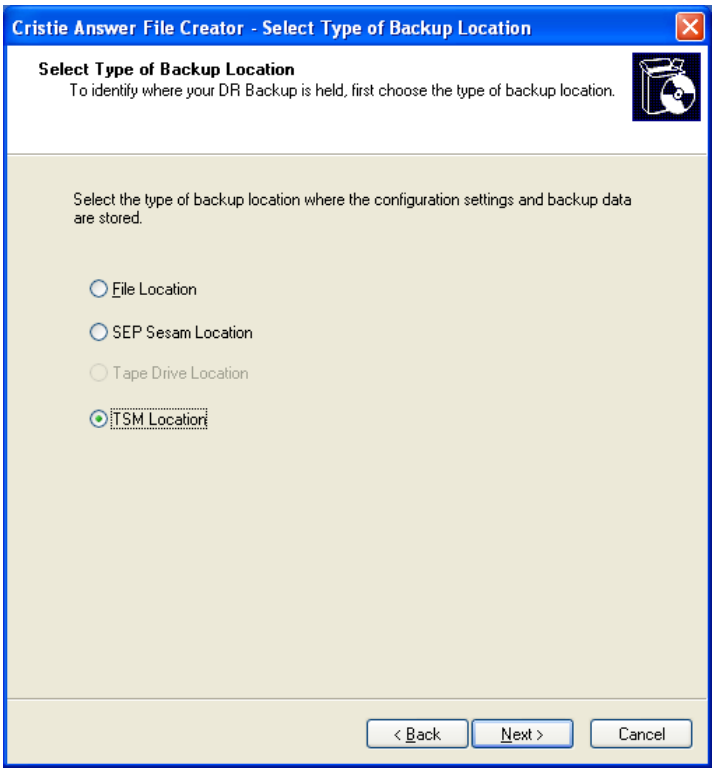
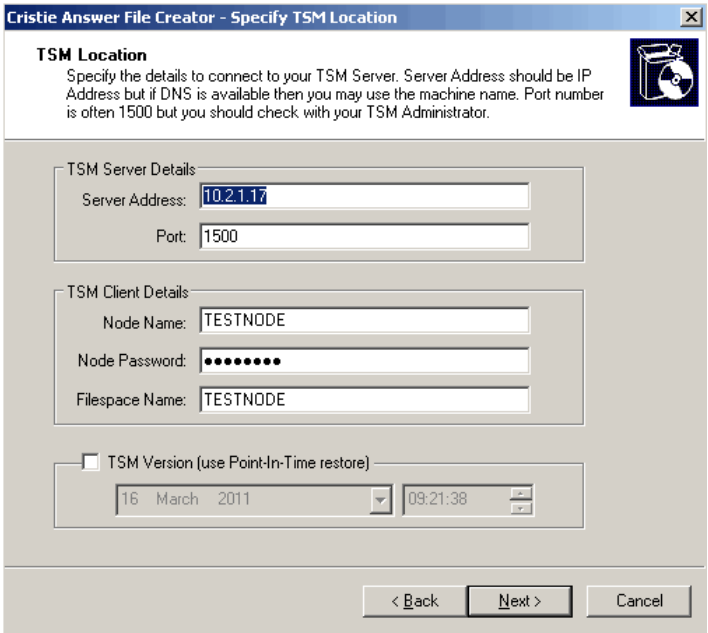
2.4.1.2 Backup To TSM Location

Select **'TSM Location'**.


Cristie Answer File Creator - Select Type of Backup Location
Select Type of Backup Location
To identify where your DR Backup is held, first choose the type of backup location.
Select the type of backup location where the configuration settings and backup data are stored.
File Location
SEP Sesam Location
Tape Drive Location
TSM Location
< Back
Next >
Cancel

Select Next> to proceed to the **TSM Location** specification details.

Identify the name or IP address of your TSM server and the TSM Node/Filespace containing your backup:


Cristie Answer File Creator - Specify TSM Location
TSM Location
Specify the details to connect to your TSM Server. Server Address should be IP Address but if DNS is available then you may use the machine name. Port number is often 1500 but you should check with your TSM Administrator.
TSM Server Details
Server Address: 10.2.1.17
Port: 1500
TSM Client Details
Node Name: TESTNODE
Node Password: ••••••••
Filespace Name: TESTNODE
TSM Version (use Point-In-Time restore)
16 March 2011
09:21:38
< Back
Next >
Cancel

Select Next>.

If the backup is encrypted, specify the location of the encryption key repository if one exists, or the passphrase/clear key. If the backup is not encrypted, proceed to the next dialogue.

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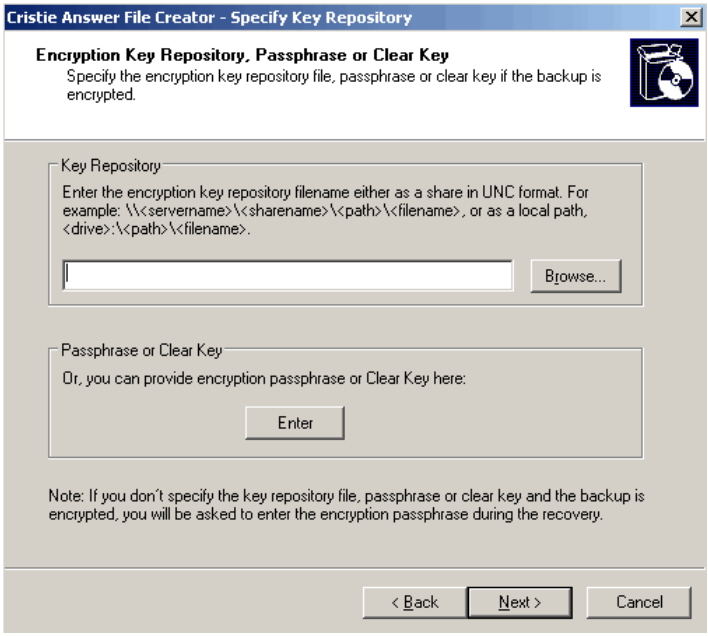
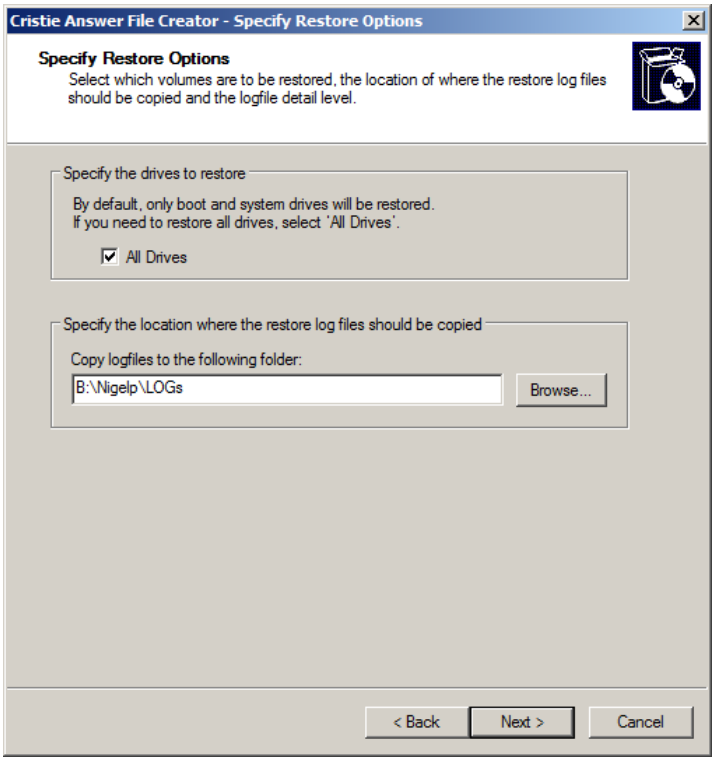

Cristie Answer File Creator - Specify Key Repository
Encryption Key Repository, Passphrase or Clear Key
Specify the encryption key repository file, passphrase or clear key if the backup is encrypted.
Key Repository
Enter the encryption key repository filename either as a share in UNC format. For example: \\<servername>\<sharename>\<path>\<filename>, or as a local path, <drive>:\<path>\<filename>.
Browse...
Passphrase or Clear Key
Or, you can provide encryption passphrase or Clear Key here:
Enter
Note: If you don't specify the key repository file, passphrase or clear key and the backup is encrypted, you will be asked to enter the encryption passphrase during the recovery.
< Back
Next >
Cancel

Select Next> to proceed to the **Specify Restore Options** dialogue.

By default, only **Boot** and **System** drives will be restored. You must specify where you want the restore log files to be copied at the end of the DR process (this is mandatory). You may also identify the level of detail in the log files.


Cristie Answer File Creator - Specify Restore Options
Specify Restore Options
Select which volumes are to be restored, the location of where the restore log files should be copied and the logfile detail level.
Specify the drives to restore
By default, only boot and system drives will be restored.
If you need to restore all drives, select 'All Drives'.
All Drives
Specify the location where the restore log files should be copied
Copy logfiles to the following folder:
B:\Nigelp\LOGs
Browse...
< Back
Next >
Cancel

Select Next> to continue to the **Disk Operations** dialogue.

Detail the individual disks to be formatted on restore, or **All Disks** if all disks should be formatted. Identify individual disks as **0**, **1**, **2**...etc.

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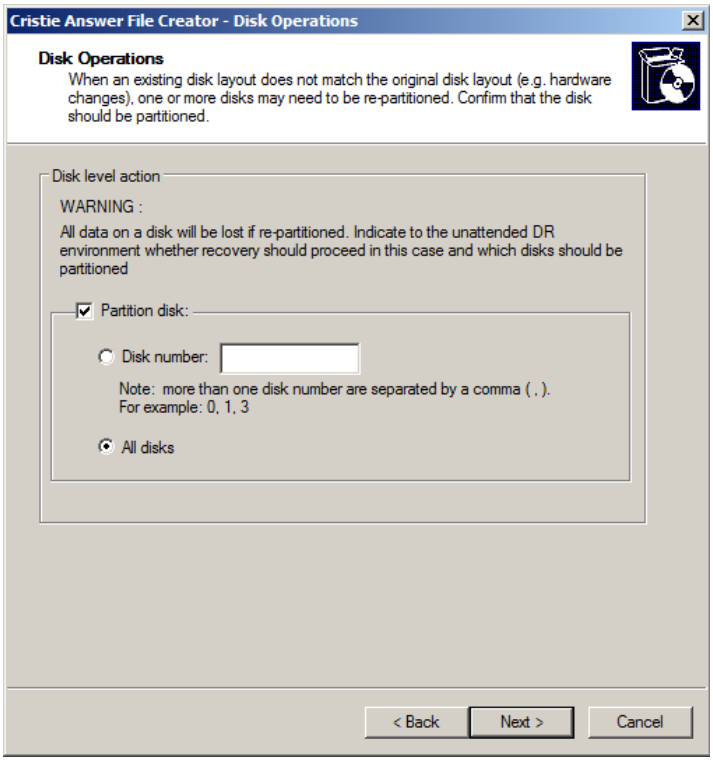
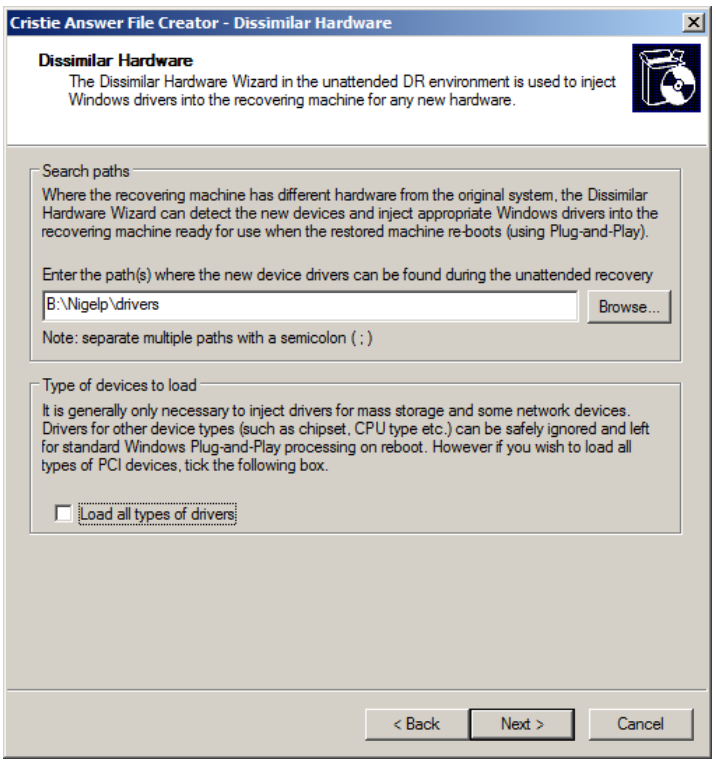

Cristie Answer File Creator - Disk Operations
Disk Operations
When an existing disk layout does not match the original disk layout (e.g. hardware changes), one or more disks may need to be re-partitioned. Confirm that the disk should be partitioned.
Disk level action
WARNING :
All data on a disk will be lost if re-partitioned. Indicate to the unattended DR environment whether recovery should proceed in this case and which disks should be partitioned
Partition disk:
Disk number:
Note: more than one disk number are separated by a comma (,).
For example: 0, 1, 3
All disks
< Back
Next >
Cancel

Select Next>. If the DR is to dissimilar hardware (ie. not the original system), then the recovered system may require new drivers to support different mass storage or network controllers. These new drivers are supplied by the customer and must be accessible to the **Dissimilar Hardware Wizard** (DHW) during the recovery process. Specify the location of a folder (or folders) where the DHW will retrieve these drivers from. For example, this could be a locally attached device like a USB disk or a network share, or both.


Cristie Answer File Creator - Dissimilar Hardware
Dissimilar Hardware
The Dissimilar Hardware Wizard in the unattended DR environment is used to inject Windows drivers into the recovering machine for any new hardware.
Search paths
Where the recovering machine has different hardware from the original system, the Dissimilar Hardware Wizard can detect the new devices and inject appropriate Windows drivers into the recovering machine ready for use when the restored machine re-boots (using Plug-and-Play).
Enter the path(s) where the new device drivers can be found during the unattended recovery
B:\Nigelp\drivers
Browse...
Note: separate multiple paths with a semicolon (;)
Type of devices to load
It is generally only necessary to inject drivers for mass storage and some network devices. Drivers for other device types (such as chipset, CPU type etc.) can be safely ignored and left for standard Windows Plug-and-Play processing on reboot. However if you wish to load all types of PCI devices, tick the following box.
Load all types of drivers
< Back
Next >
Cancel

Typically, only mass storage and network controllers need to be considered. However, if all driver

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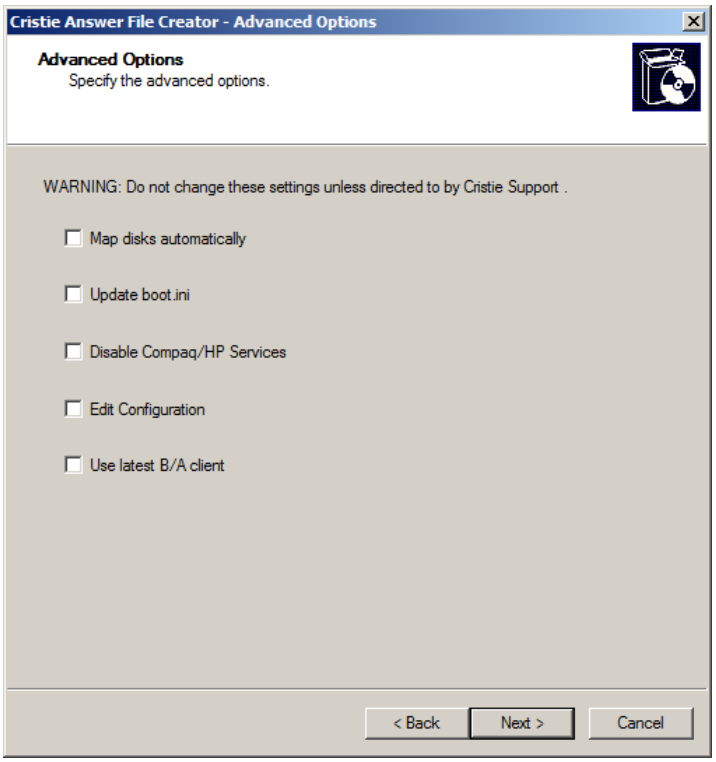
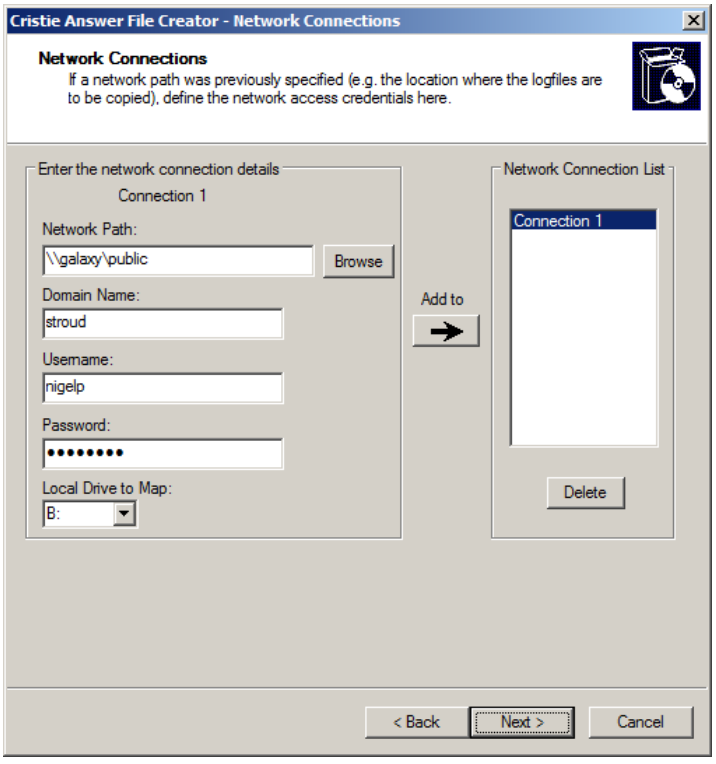
classes need to be examined, select the *Load all types of drivers* tick box. Select Next> to continue to the **Advanced Options** dialogue.

Unless **Cristie Support** direct you to change these settings, leave them at their default settings.


Cristie Answer File Creator - Advanced Options
Advanced Options
Specify the advanced options.
WARNING: Do not change these settings unless directed to by Cristie Support .
Map disks automatically
Update boot.ini
Disable Compaq/HP Services
Edit Configuration
Use latest B/A client
< Back
Next >
Cancel

Press Next> to continue to the **Network Connections** dialogue. Here you can define a list of network connection credentials that will be used by automated DR to access any network shares identified in earlier dialogues (eg. copy log files, DHW drivers etc).



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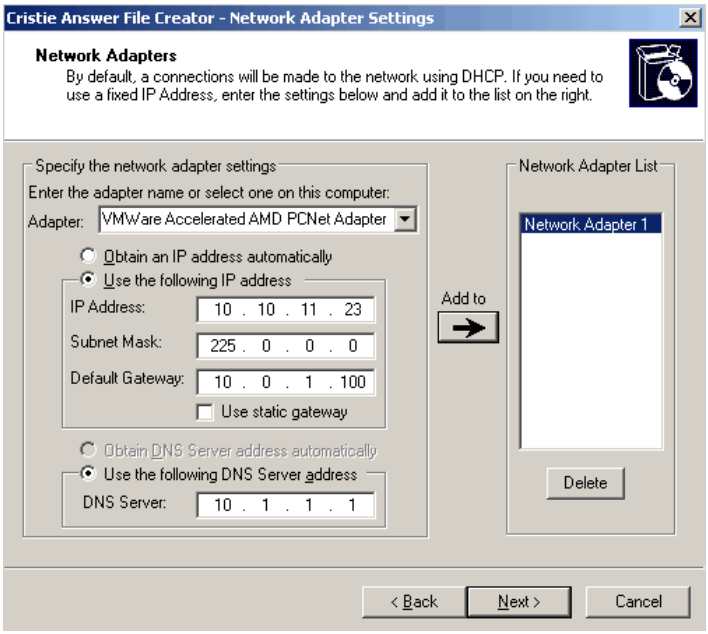
Press the Add to -> button to add a new definition to the Connection list. Use the Delete button to remove an existing Connection definition. Press Next> to continue to the **Network Adapter** dialogue.

You should now specify how the default network settings should be setup in the PE 2 DR environment at boot time.


Cristie Answer File Creator - Network Adapter Settings
Network Adapters
By default, a connections will be made to the network using DHCP. If you need to use a fixed IP Address, enter the settings below and add it to the list on the right.
Specify the network adapter settings
Enter the adapter name or select one on this computer:
Adapter:
VMWare Accelerated AMD PCNet Adapter
Obtain an IP address automatically
Use the following IP address
IP Address:
10 . 10 . 11 . 23
Subnet Mask:
225 . 0 . 0 . 0
Default Gateway:
10 . 0 . 1 . 100
Use static gateway
Obtain DNS Server address automatically
Use the following DNS Server address
DNS Server:
10 . 1 . 1 . 1
Add to
Network Adapter List
Network Adapter 1
Delete
< Back
Next >
Cancel

These settings apply to the recovery environment only - not the restored machine. Create a new Adapter name and associated network settings or use an existing network adapter and settings captured from the current host.

Press the Add to -> button to add a new definition to the Adapter list. Use the Delete button to remove an existing Adapter definition. Press Next> to continue to the **Reboot Options** dialogue.

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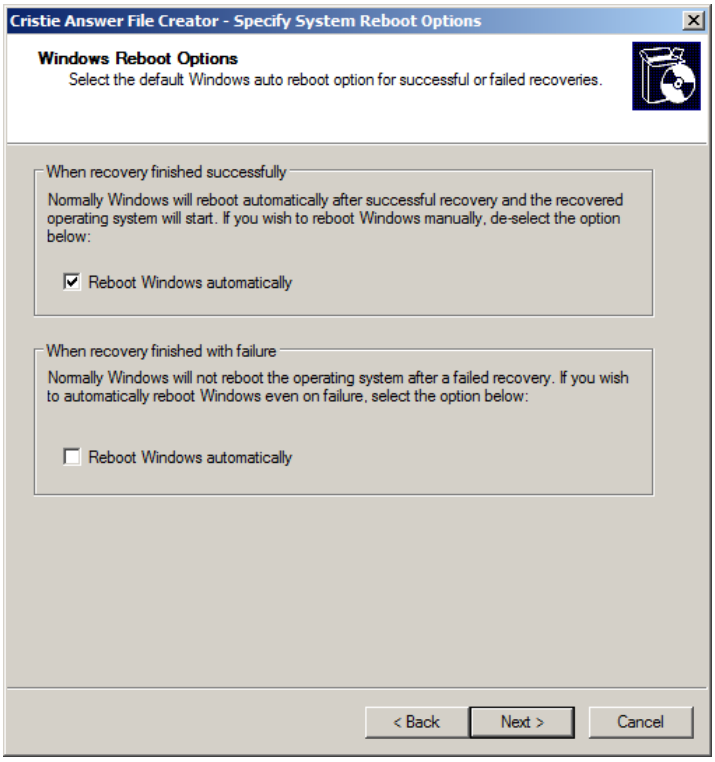
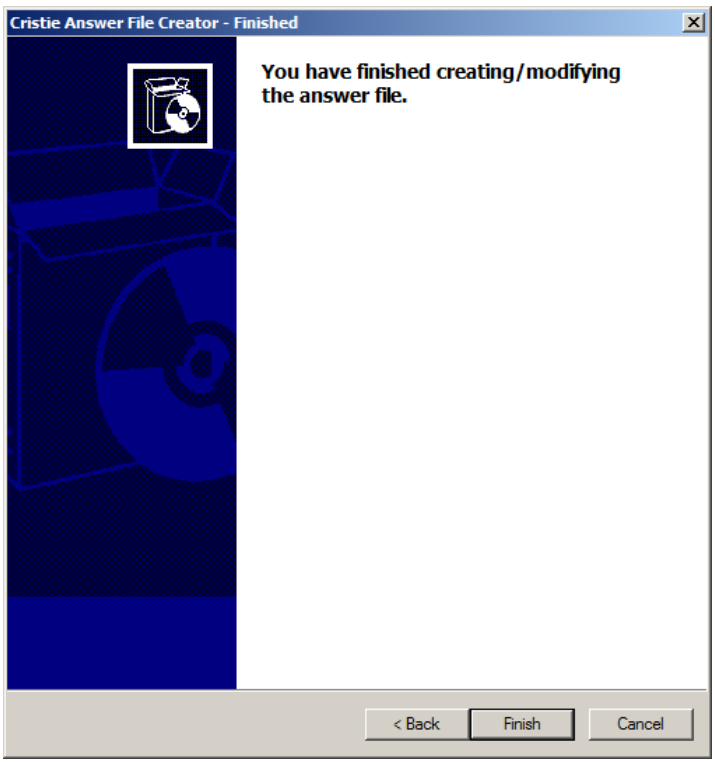

Cristie Answer File Creator - Specify System Reboot Options
Windows Reboot Options
Select the default Windows auto reboot option for successful or failed recoveries.
When recovery finished successfully
Normally Windows will reboot automatically after successful recovery and the recovered operating system will start. If you wish to reboot Windows manually, de-select the option below:
Reboot Windows automatically
When recovery finished with failure
Normally Windows will not reboot the operating system after a failed recovery. If you wish to automatically reboot Windows even on failure, select the option below:
Reboot Windows automatically
< Back
Next >
Cancel

Specify how the automated DR should handle the post recovery reboot when the DR finishes with success or failure. If the DR is successful, select the automatic reboot option. If the DR fails, it is unlikely that the reboot will succeed, so there is little point in proceeding with the reboot. However, if a reboot should be attempted, even in a failure scenario, tick the failure auto reboot option.

The completion of the Answer File definition is confirmed with the following dialogue:



Select Finish to generate the answer file. A pop-up will be displayed prompting for the name and

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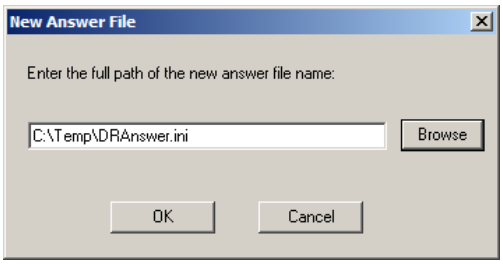
location of where the AFC should create the answer file.



Select a path and press OK. This will create a file called `DRAnswerFile.ini` in the `C:\Temp` folder.

Note: the answer file MUST be called DRAnswer.ini when transferred to the ISO.

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Answer File Content Example:

The content of a typical answer file is shown below for reference:

```
[ProductType]
Product = "CBMR"

[CbmrCmdBackupLocation]

TsmFilespaceName=/TESTNODE
TsmNodeName=TESTNODE
TsmNodePassword=Encrypted: 828211CF2AC6B2
TsmPort=1500
TsmServerName=10.2.1.17
DeviceType=Tsm
EncryptLocType=
PointInTime=

[RestoreData]

Drives = "Default"

[LogFiles]

RestoreLogDetailed = "No"
LogfileCopyPath = "\\10.2.1.21\share1\nigelp\gemma"

[System]

RebootOnSuccess = "True"
RebootOnFailure = "False"

[DiskOperation]

PartitionDisk = "All"

[Cloning]
```

2.5 Prepare Boot Media For Automated Recovery

The product boot media (i.e. the DR console ISO file) is now prepared by the CRISP (Cristie ISO Producer) tool. Please refer to the separate **CRISP User Guide** documentation for details on how to do this.

To prepare boot media for automated recovery, the boot image must be customised to both auto boot and to add the answer file to an expected location. The auto boot modification is required because normally the PE 2 distribution media is designed to prompt for DR boot. By default, it will not boot into DR unless a key is pressed. If no key is pressed, any installed OS is booted instead. This behaviour needs to be suppressed for automated recoveries. This is described in Customise Boot Media For Auto Boot.

If the answer file needs to be added to CBMR boot media itself, an ISO editing tool such as

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MagicISO or **UltraISO** is required. This is then used to extract the Windows PE 2 boot file from the distribution ISO image. It can also be used to create the new modified ISO image containing the answer file.

During an automated DR sequence, the Windows PE 2 environment will search for the answer file in one of these locations and in this order of precedence:

1. The root folder of the Windows PE 2 boot environment (always drive X: when booted)
2. The root folder of the CD/DVD containing the CBMR distribution media
3. The root folder of any locally attached removable storage

As soon as a suitable answer file is found in one of these locations, the search stops and that answer file is used to control the automated DR process. If no answer file is found, the normal interactive DR GUI is started. Refer to sections Add Answer File To Product ISO Root Folder and Add Answer File to Boot Image Root Folder for a discussion on how this is achieved.

The boot image created for Option 1 is suitable for network boot, but requires the standard CBMR boot image or WIM file to be customised.

Use Option 3 above when customising the boot image is not practical. In this case, simply copy the generated answer file to the root folder on suitable removable storage (eg. USB disk).

Note: the answer file will only be detected during boot if the file is located in one of the three locations specified above.

2.5.1 Customise Boot Media For AutoBoot

By default, the PE 2 distribution media will display a prompt to boot into the DR environment when auto-run. If no key is pressed, any alternative installed OS is booted instead. For automated DR, this behaviour needs to be suppressed.

At the moment the only way to do this is to customise the CBMR distribution media. This section describes how to achieve this for the PE 2 environment.

2.5.1.1 Windows PE 2

The steps required to customise the Windows PE 2 ISO image for auto boot are as follows:

Open the product PE 2 distribution media image with your ISO editor:

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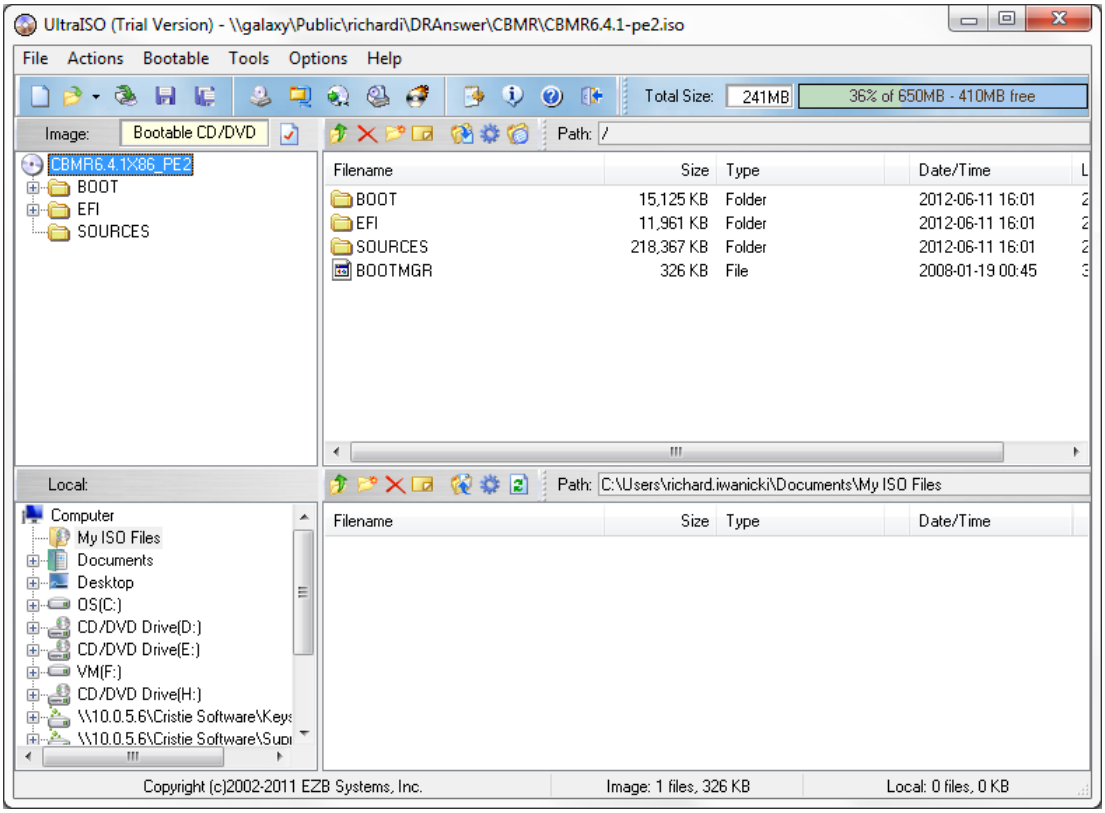
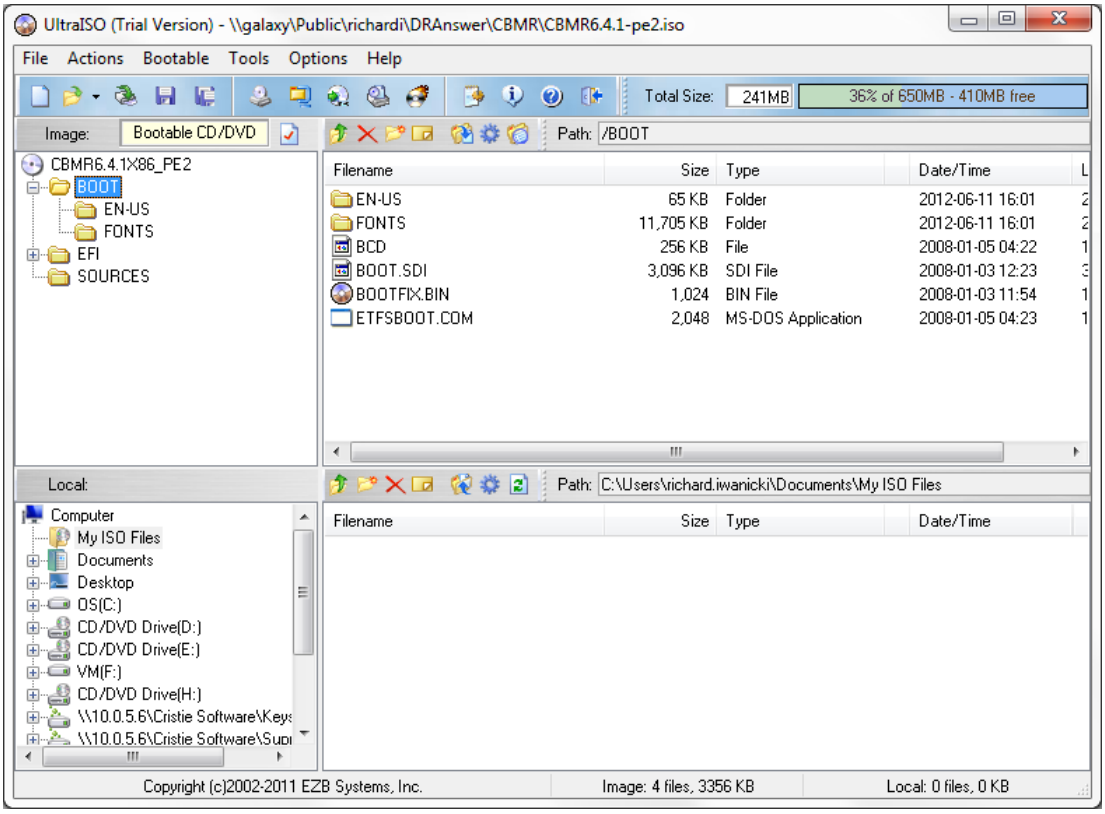


Then navigate to the BOOT folder as illustrated:



Right click on the file `BOOTFIX.BIN` in this folder and select Delete in the pop-up menu.

Save the modified ISO. This action will create a new ISO with the `BOOTFIX.BIN` file removed. The

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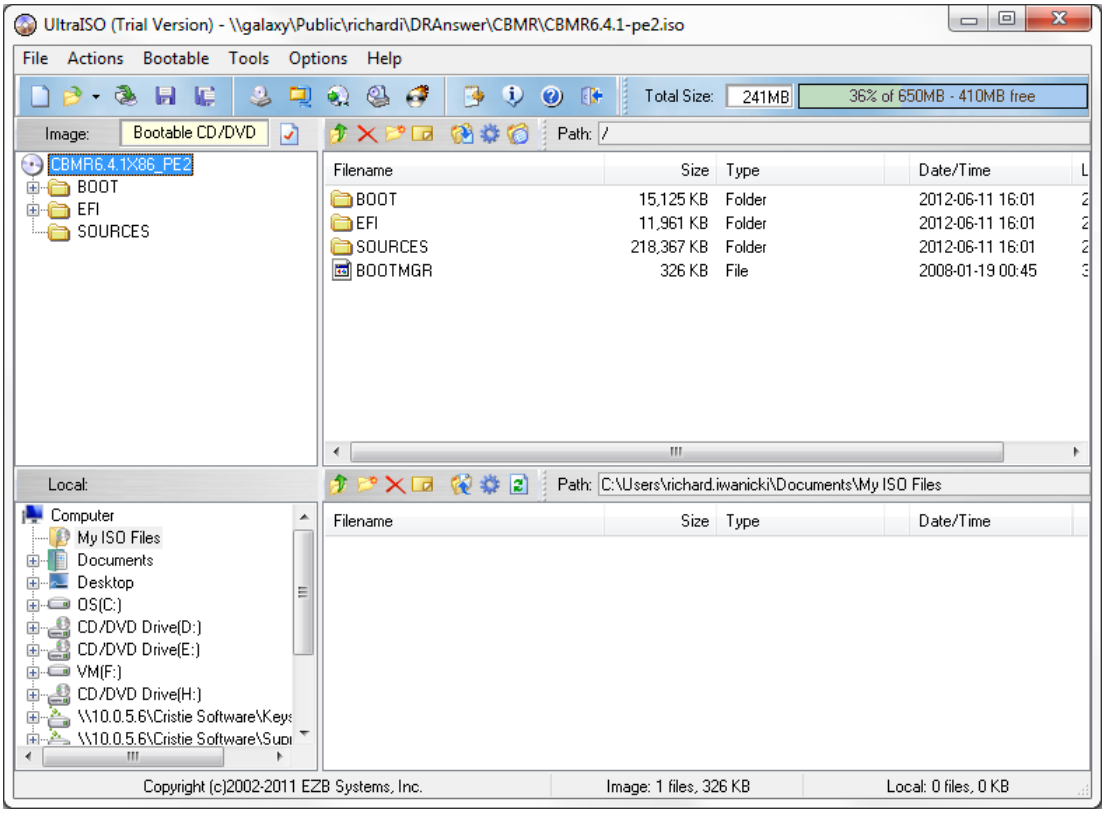
modified PE 2 ISO will now automatically boot into the PE 2 environment.

2.5.2 Add Answer File To Product ISO Root Folder

To add the answer file to the root folder of the boot image follow these steps:

Open the distribution media image with your ISO editor:



Drag and drop your answer file into the root of the ISO:

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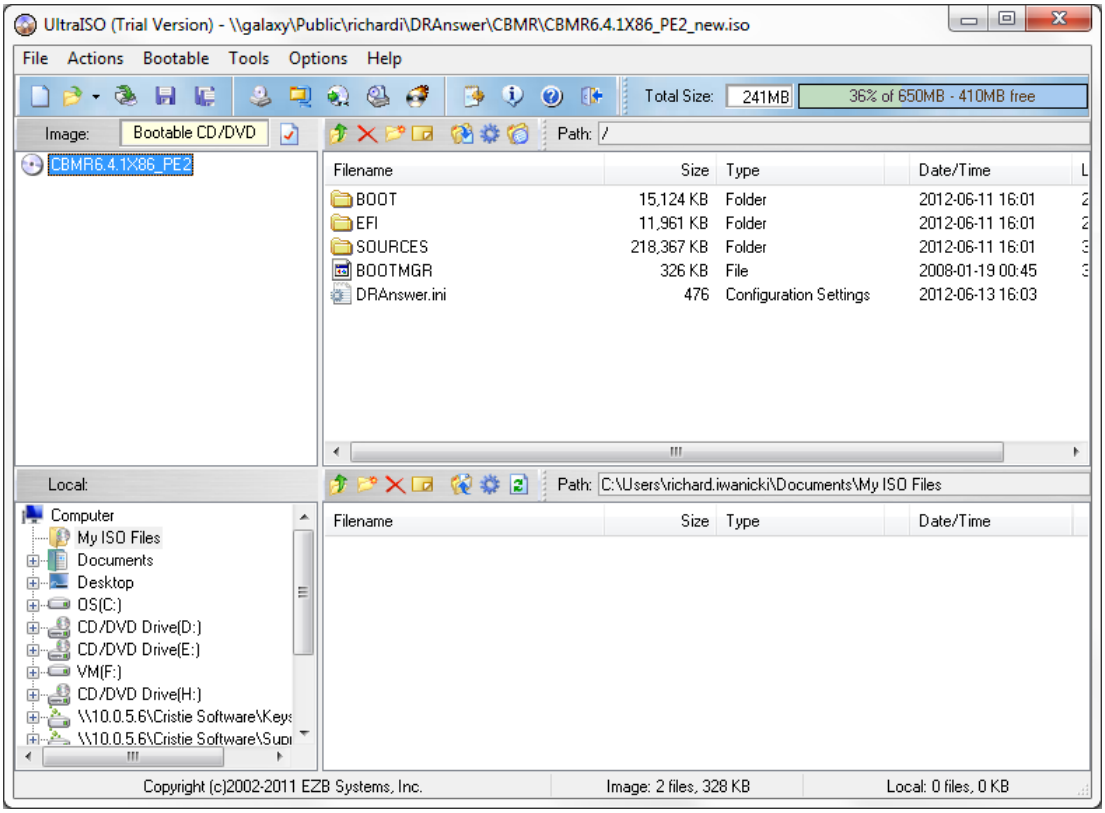

Now save the new ISO image to a new file or overwrite the existing image. Use this new ISO image to create new physical CD/DVDs as required.

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2.5.3 Add Answer File to Boot Image Root Folder

The PE 2 boot image is in Microsoft WIM file format. Use an ISO editor to extract the WIM file from the product distribution media and use the Microsoft Windows Automated Installation Kit (WAIK) tools to add the answer file.

Note: You may already have the WAIK installed from using CRISP to generate the CBMR recovery ISO.

2.5.3.1 Windows PE 2

The PE 2 boot image is in WIM file format and can only be modified by using the Microsoft Windows Automated Installation Kit (WAIK). Download the WAIK version 1.1 (dated 25/2/2008) from the Microsoft Download Center. This is the February 2008 update.

The downloaded image (in .IMG format) should be burnt to a DVD (it is too large for a CD) and installed on a suitable PC. Run the .NET 2.0, MSXML 6.0 and Windows AIK Setup options in that order.

Welcome to Windows Automated Installation Kit
Windows Vista
Windows Automated Installation Kit
Getting Started for IT Pros
Windows AIK Setup
Release Notes
Windows Deployment Services
Browse DVD
.NET Framework Setup
MSXML 6.0 Setup
Exit
Welcome to the Windows Automated Installation Kit
Install this last
Automated Installation Kit (Windows AIK) helps you to preinstall, customize, and deploy the Windows Vista and Windows Server 2008 operating systems.
To run the Windows AIK, your technician computer must use the Windows XP Professional with Service Pack 2, Windows Server 2003 with Service Pack 1, Windows Vista, or Windows Server 2008 system.
Install this first
Install this second

With the WAIK successfully installed, the steps required to modify the Windows PE 2 WIM image are as follows:

Open the product PE 2 distribution media image with your ISO editor:

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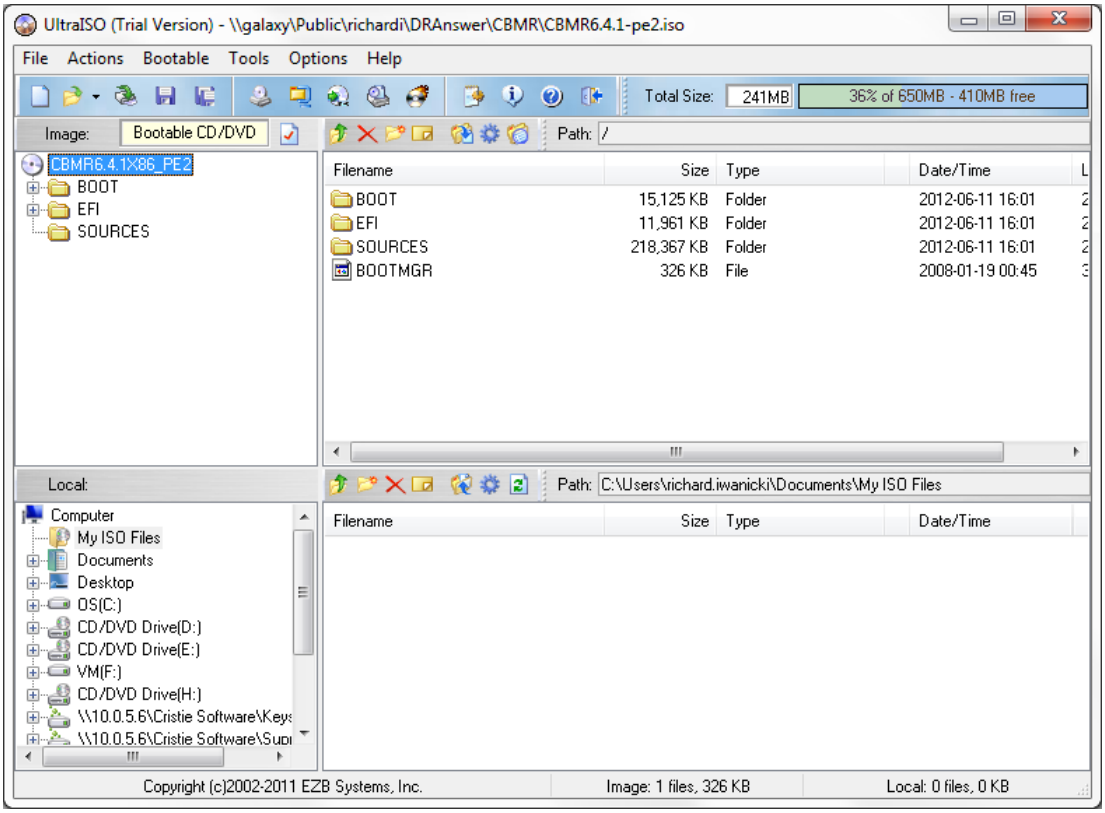
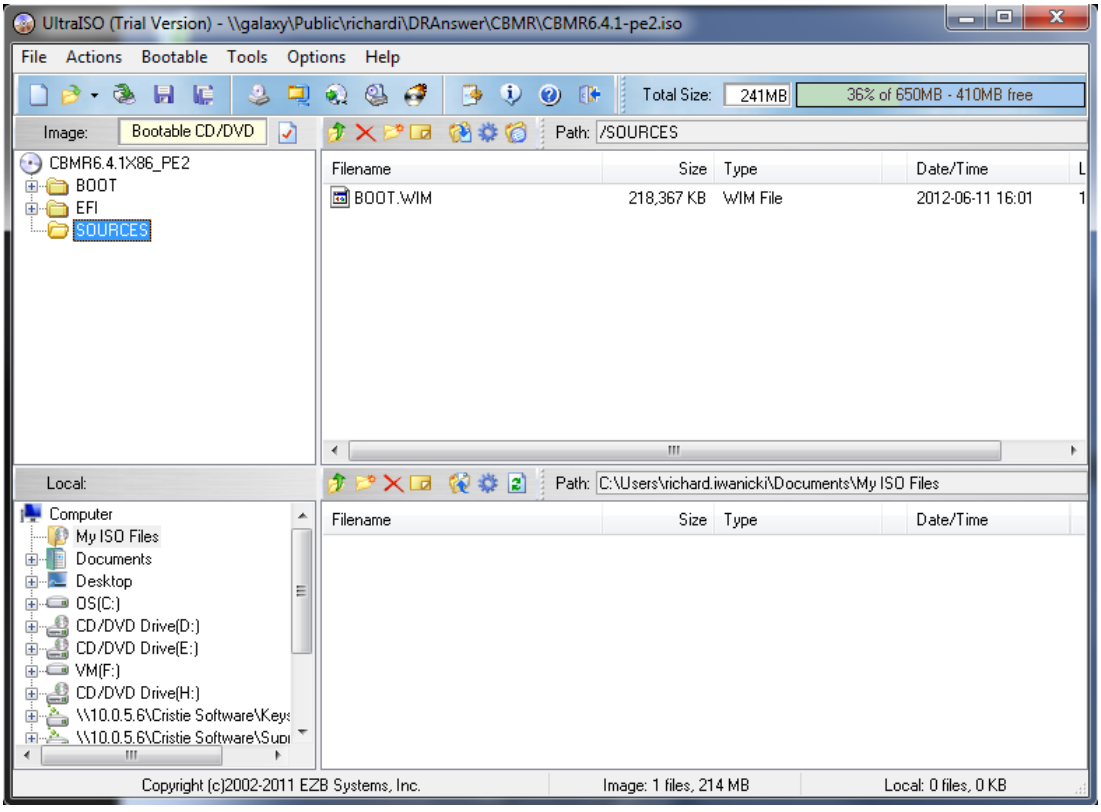


Navigate to the `\SOURCES` folder and extract the file `BOOT.WIM` to a convenient location.



The following description assumes the `BOOT.WIM` file has been extracted to `C:\Temp`. It also assumes that the answer file is also in `C:\Temp`. The WIM is edited by mounting the image onto a standard folder in the file system. Once this is done, the answer file can be simply copied into the

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target folder and the image unmounted.

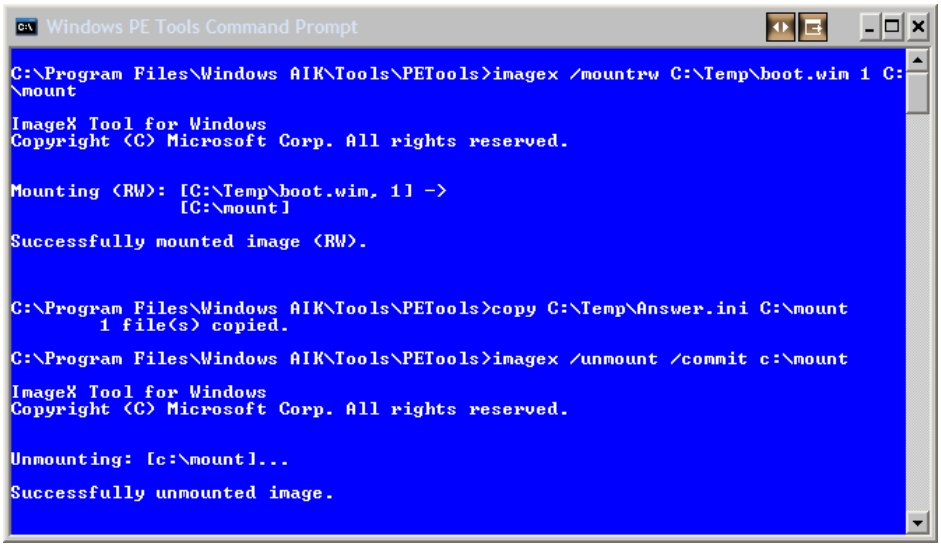
It is therefore necessary to create a folder where the WIM image will be mounted. This folder must be empty. The WAIK tool used to modify the WIM image is called **ImageX**.

Now run a **Windows PE Tools Command** window (a shortcut for this is normally created on the Desktop by the WAIK installation) and enter the command:

```
imagex /mountrw C:\Temp\boot.wim 1 C:\mount

copy C:\Temp\DRAnswer.ini C:\mount

imagex /unmount /commit C:\mount
```


Windows PE Tools Command Prompt
C:\Program Files\Windows AIK\Tools\PETools>imagex /mountrw C:\Temp\boot.wim 1 C:\mount
ImageX Tool for Windows
Copyright (C) Microsoft Corp. All rights reserved.
Mounting (RW): [C:\Temp\boot.wim, 1] ->
[C:\mount]
Successfully mounted image (RW).
C:\Program Files\Windows AIK\Tools\PETools>copy C:\Temp\Answer.ini C:\mount
1 file(s) copied.
C:\Program Files\Windows AIK\Tools\PETools>imagex /unmount /commit c:\mount
ImageX Tool for Windows
Copyright (C) Microsoft Corp. All rights reserved.
Unmounting: [c:\mount]...
Successfully unmounted image.

The modified WIM file can then be either added back into the product ISO or kept and used in conjunction with Windows Deployment Services (WDS) for remote network boot. If required, use the ISO editor to write the WIM file back into the product ISO in the `\SOURCES` folder.

Note: the answer file MUST be named DRAnswer.ini when transferred to the ISO.

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3 Recovery

An automated recovery can be initiated either by a network or CD/DVD boot of the customised CBMR boot image as described in Prepare Boot Media For Automated Recovery.

Starting the boot process is the only part of the restore process that requires manual intervention. Even this can be avoided if a suitable Lights-Out system is in place or remote boot is possible.

Note: the system BIOS should be set to boot from the prepared Windows PE boot ISO whether this is in the form of a physical CD/DVD or ISO image. It is also possible to network boot the PE 2 image.

3.1 Boot Recovery Environment

Once the customised boot image is booted, the normal plug and play sequence will run. The automated DR will then proceed if the DR answer file is found in one of the prescribed locations. If the file is not found, the normal interactive GUI will be displayed.

3.1.1 Answer File In CD/DVD Image

If the DR answer file is detected within the CD/DVD image, then the automated DR will proceed with no user intervention. Each step in the disaster recovery process will be displayed on the system console and recorded to a log file. This log file will be transferred to the location specified in the DR answer file at the end of the recovery.

At the end of the DR sequence, the logs will be copied to the location specified in the answer file. At this point the recovered system will be automatically booted if configured as such in the DR answer file. Otherwise manual intervention will be required to boot the system (by pressing the <ESC> key).

If errors are detected during the restore process, the recovery will halt or re-boot the system depending upon the setting in the answer file.

Note: if the boot media is configured to boot directly into the PE 2 boot environment after recovery, manual intervention will be required to reset the boot sequence on the system. This must be done in order to prevent the PE 2 boot environment being booted once more. Normally the system BIOS should be reset to boot from the OS disk as required.

3.1.2 Answer File On Removable Device

If the DR answer file is detected on any attached removable media, then the automated DR will proceed with no user intervention. Each step in the disaster recovery process will be displayed on the system console and recorded to a log file. This log file will be transferred to the location specified in the DR answer file at the end of the recovery.

At the end of the DR sequence, the logs will be copied to the location specified in the answer file. At this point the recovered system will be automatically booted if configured as such in the DR answer file. Otherwise manual intervention will be required to boot the system (by pressing the <ESC> key).

If errors are detected during the restore process, the recovery will halt or re-boot the system depending upon the setting in the answer file.

Note: if the boot media is configured to boot directly into the PE 2 boot environment after recovery, manual intervention will be required to reset the boot sequence on the system. This must be done in order to prevent the PE 2 boot environment being booted once more. Normally the system BIOS should be reset to boot from the OS disk as required.

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3.2 Check Result Of Recovery

It is recommended that after the recovery has completed, the saved log files are inspected to ensure that the DR ran with no reported errors.

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